

Claims

1. Panels with coupling elements, which are designed
5 in such a manner that two panels (1,2) can be
connected to one another by form-fit connection at
the same time in a first direction (X)
perpendicular to the common joint (5) and in a
second direction (Z) parallel and perpendicular to
10 the common surface of the panels,

characterised in that

the coupling elements (3,4,8,10) are designed in
15 such a manner that the two panels can be connected
to one another by form-fit connection in a third
direction (Y) along the common joint (5).
2. Panels according to claim 1 **characterised in that**
20 the panels (1,2), especially including some or all
of the coupling elements, consist entirely or
predominantly of wood and/or a wooden material.
3. Panels according to claim 1, **characterised in that**
25 at least one separate coupling element (8) is
provided, which is manufactured separately from the
panels or which is manufactured from a different
material from the panels.
- 30 4. Panels according to any one of the preceding
claims, **characterised in that** horizontal contact
surfaces (41) are provided on the coupling
elements, which achieve the connection in the
second direction (Z).

5. Panels according to any one of the preceding claims, **characterised in that** vertical contact surfaces (41,11, 85) are provided on the coupling elements, which achieve the connection in the first direction (X).
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6. Panels according to any one of the preceding claims, **characterised in that** vertical contact surfaces (86, 12) are provided on the coupling elements, which achieve the connection in the third direction (Y).
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7. Panels according to any one of the preceding claims, **characterised in that** contact surfaces (41) are designed as a tongue and groove connection.
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8. Panels according to any one of the preceding claims, **characterised in that** recesses (10) are provided in the contact surfaces (41), in which the separate coupling element is held.
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9. Panels according to any one of the preceding claims, **characterised in that** the separate coupling element is held in the recess especially by press-fit connection.
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10. Panels according to any one of the preceding claims, **characterised in that** the separate coupling element is held in the recess especially by form-fit connection.
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11. Panels according to any one of the preceding claims, **characterised in that** the panels (1,2) are

connected in the second direction (Z) by means of a first coupling element (3,4) and in the first and third direction (X,Y) by a secondary coupling element (8).

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12. Panels according to any one of the preceding claims, **characterised in that** the secondary coupling element is a separate coupling element (8).

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13. Panels according to any one of the preceding claims, **characterised in that** the secondary coupling element consists of a material, which provides a larger restoring force by comparison with the material of which the panels consist.

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14. Panels according to any one of the preceding claims, **characterised in that** the secondary coupling element is such that it can be compressed in the third direction (Y) against its own restoring force.

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15. Panels according to any one of the preceding claims, **characterised in that** the secondary coupling element can be introduced into the recess, when it has been compressed and cannot be withdrawn from the recess unless it has been compressed.

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16. Panels according to any one of the preceding claims, **characterised in that** the recesses (10) provide undercutting (11), behind which surfaces (85) of the secondary coupling element inserted into the recess can lock, in such a manner that the secondary coupling element is locked in the first

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direction (X), preventing withdrawal from the recess.

17. Panels according to any one of the preceding
5 claims, **characterised in that** the surfaces (85) and the undercutting (11) is chamfered in such a manner that when engaged with one another, the surfaces and the undercutting cause the secondary coupling element to be drawn into the recess.
- 10 18. Panels according to any one of the preceding claims, **characterised in that** the recess (10) provides a wall (19) opposing the undercutting of the recess and extending in the second direction
15 (Z), in such a manner that the secondary, inserted connecting element is locked in the first direction (X), preventing it from being pushed-in or withdrawn.
- 20 19. Panels according to any one of the preceding claims, **characterised in that** the secondary coupling element is such that, when it is inserted into the recess, the panels cannot be compressed together in the region of the common contact
25 surface (41).
20. Panels according to any one of the preceding claims, **characterised in that** the secondary coupling element is designed as a letter "H".
- 30 21. Panels according to any one of the preceding claims, **characterised in that** the secondary coupling element provides two arms (88) extending essentially parallel to one another of which the

free ends can be moved in a resilient manner relative to one another.

22. Panels according to any one of the preceding
5 claims, **characterised in that** the secondary coupling element and the recess are such that the secondary coupling element can be introduced into the recess exclusively in one direction parallel to the surface of the panels.
- 10 23. Panels according to any one of the preceding claims, **characterised in that** the surfaces (85) for engaging with the undercutting (11) of the recess (10) are provided at the free ends (81,82) of the
15 arms.
24. Panels according to any one of the preceding claims, **characterised in that** the free ends of the arms provide a tapering (84), such that, these are
20 temporarily pressed against their own restoring force, when they are compressed in order to introduce the secondary coupling element into the recess (10).
- 25 25. Panels according to any one of the preceding claims, **characterised in that** the recess is designed in such a manner that it can be manufactured by milling with a stepped-milling head, especially a stepped-milling head which can
30 be moved in a first, second and third direction (X,Y,Z).
26. Panels according to any one of the preceding claims, **characterised in that** at least one panel

(1,2) provides a carrier board consisting of a wooden material, especially consisting of HDF or MDF.

5 27. Panels according to any one of the preceding claims, **characterised in that** a decorated paper or a decoration is provided on the upper side.

10 28. Panels according to any one of the preceding claims, **characterised in that** at least one panel (1,2) provides a carrier board, which consists of several papers compressed together, especially which are provided with amino-plastic thermo-hardening resins.

15 29. Panels with coupling elements according to any one of the preceding claims, **characterised in that** these are provided on one or both narrow sides (6) of a panel and further coupling elements are
20 provided preferably on the longitudinal sides (7) of the panels (1,2), in such a manner that these can be connected exclusively by a rotary movement about their common connecting joint.

25 30. Panels [with coupling elements] according to any one of the preceding claims, **characterised in that** these are provided on one or both narrow sides (6) of a panel and further coupling elements, are
30 provided preferably on the longitudinal sides (7) of the panels (1,2) in such a manner that these can be connected at the longitudinal side exclusively by a horizontal movement towards one another.

31. Panels [with coupling elements] according to any one of the preceding claims, **characterised in that** these are provided on one or both narrow sides (6) of a panel and further coupling elements are
5 provided preferably on the longitudinal sides (7) of the panels (1,2) in such a manner that these can be connected by displacement in one plane and/or by vertical lowering of a panel (2) relative to the surface of the second panel (1).

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32.. Panels according to any one of the preceding claims, **characterised in that** these are rectangular or square and/or are 6 to 15 mm thick and/or 100 to 2000 mm long and/or 100 to 2000 mm wide.

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33. Covering, especially a floor covering, formed from panels according to any one of the preceding claims.

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